BLiNQ NETWORKS

Spectrum Management & Interference Detection

January 3, 2013

Small Cell Proliferation & Non-Line of Sight (NLOS) Backhaul

As Commenters Have Recognized, We Must Bring Backhaul to the Small Cell Rather than Bringing the Small Cell to Backhaul

Better Coverage and Capacity

Better Interference Management

Smarter Spectrum Usage

Optimal Use of the 3.5 GHz Band Is Driven Not by Low Power, But by Smart Coexistence

Directional Antenna (Beamformer) with Proper Tilting Can Allow Higher-Power Uses While Eliminating Inter-Cell Interference

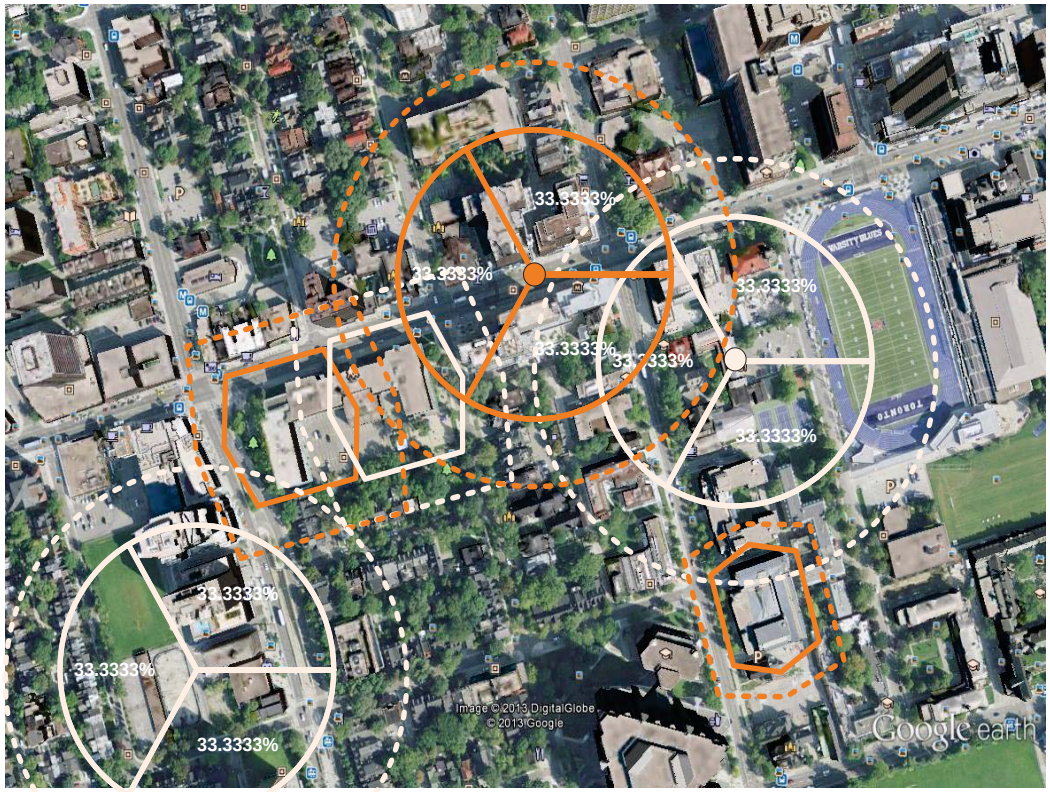
Time, Frequency, and Spatial Multiplexing (Plus Coordination) Offer An Excellent Coexistence Platform for Diverse Applications & Different Technologies

Existence of Incumbents Already Requires Management of Diverse Applications

NLOS Backhaul Can Readily Co-Exist at 3.5 GHz if Power Limits Are Relaxed in a Portion of the Band

Coordinated & Microtargeted Spectrum Assignment

- **Coordinated Authorizations**
  - Uncoordinated Co-Existence is Inefficient
  - Leverage the SAS to Coordinate Deployments
  - Synchronization Shrinks Interference Contours
  - Time-Based Sharing Facilitates Further Access
- **Microtargeted Assignments (*e.g.*, Building-Sized Areas)**
  - Promotes Co-Existence of Indoor and Outdoor Uses
  - Encourages More Intensive Use of Spectrum



Above: Microtargeted Co-Existence between Indoor (Hexagonal) and Outdoor (Circular) Deployments at Different Frequencies (Orange vs. White)

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SAS and Device Capabilities

To Promote Coordinated and Intensive Use of the Band:

- *The SAS Must Predict the Received Signal Level (RSL) of PA and GAA Operations over an Area*
- *The SAS Must Dynamically Authorize Usage of Channels*
- *All Devices Must Have Channel-Hopping and Listen-Before-Talk Capabilities*

AU Device Capabilities

1 ms Slot Synchronization

Deployment Configuration Report (DCR)

Initial Channel Assignment List

Initial Channel Scanning & Report

Periodic Interference Sensing (CBP)

Dynamic Channel Hopping

Power Control

Unique Broadcast ID

SAS Capabilities

"Master Clock"

Authorization Based on DCR

Channel Assignment List

Channel Report Processing

Periodic Sensing Report Processing

Dynamic Channel Assignment

Power Control

Unique Broadcast ID Assignment

Implementation